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(JPFA/JSA)

**Stainless steel threaded fittings**

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## Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Pipe Fittings Association (JPFA)/ Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS B 2308**:2002 is replaced with this Standard.

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# Stainless steel threaded fittings

## Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **ISO 4144** published in 2003 with some modifications of the technical contents as well as the addition of materials and types conventionally used in Japan.

The portions with continuous sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with explanations is given in Annex JA.

## 1 Scope

This Standard specifies stainless steel threaded fittings (hereafter referred to as “fittings”) used for ordinary piping for steam, air, gas, water<sup>1)</sup>, oil, etc.

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 4144:2003 *Pipework—Stainless steel fittings threaded in accordance with ISO 7-1* (MOD)

The symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

Note <sup>1)</sup> It refers to supply water, general service water, water for fire-fighting, water for industrial use, cold and hot water for air-conditioning, cooling water, etc.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. For standards with the year indication, only the editions of the indicated year shall be applied and the revisions (including amendments) made thereafter shall not be applied. For those without the indication of the year, the most recent editions (including amendments) shall be applied.

JIS B 0151 *Iron and steel pipe fittings—Vocabulary*

JIS B 0202 *Parallel pipe threads*

NOTE : Corresponding International Standard: ISO 228-1:1994 *Pipe threads where pressure-tight joints are not made on the threads—Part 1: Dimensions, tolerances and designation* (MOD)

JIS B 0203 *Taper pipe threads*

NOTE : Corresponding International Standard: ISO 7-1:1994 *Pipe threads where pressure-tight joints are made on the threads—Part 1: Dimensions, tolerances and designation* (MOD)

JIS B 0205-4 *ISO general purpose metric screw threads—Part 4: Basic dimensions*

NOTE : Corresponding International Standard: ISO 724:1993 *ISO general-purpose metric screw threads—Basic dimensions* (IDT)

JIS B 0254 *Limit Gauges for Parallel Pipe Threads*

JIS G 0575 *Method of copper sulfate-sulfuric acid test for stainless steels*

JIS G 3214 *Stainless steel forgings for pressure vessels*

JIS G 3459 *Stainless steel pipes*

JIS G 4303 *Stainless steel bars*

JIS G 5121 *Corrosion-resistant cast steels for general applications*

JIS S 3200-1 *Equipment for water supply service—Test methods of hydrostatic pressure*

JIS S 3200-7 *Equipment for water supply service—Test methods of effect to water quality*

ISO 6708:1995 *Pipework components—Definition and selection of DN (nominal size)*

### 3 Terms and definitions

For the purposes of this Standard, the terms and definitions given in **JIS B 0151**, and the following apply.

#### 3.1 fitting

joint composed of one or more parts

#### 3.2 jointing thread

thread on outlet of fitting according to **JIS B 0203**

#### 3.3 fastening thread

thread other than jointing thread of fitting according to **JIS B 0205-4**, **JIS B 0202**, etc.

#### 3.4 fitting size (designation of thread size)

nominal designation of thread of outlet threaded according to **JIS B 0203**

#### 3.5 nominal size (DN)

nominal size specified in **ISO 6708**

NOTE : The nominal size (DN) is designated by the letters “DN” followed by an appropriate number.

#### 3.6 reinforcement

thicker part added on major diameter of internally threaded portion of fitting

#### 3.7 rib

axially aligned part added on outside or inside of fitting locally for assistance in assembling or manufacturing

### 3.8 outlet

internally or externally threaded end of fitting for jointing pipes, fittings or other piping components which are threaded according to **JIS B 0203**

### 3.9 chamfer

frustum portion where start of thread of outlet of fitting is removed to assist jointing and to prevent damage to end of thread

### 3.10 hollow shape

shape of hollow

### 3.11 solid shape

shape of solid

## 4 Types of fittings and symbols thereof

Fittings of 14 types and symbols thereof shall be as given in table 1.

**Table 1 Types of fittings and their symbols**

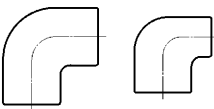
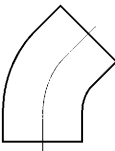
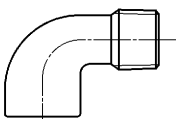
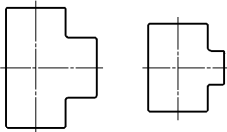
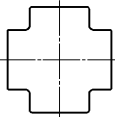
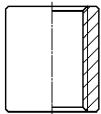
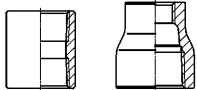
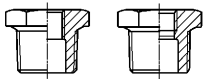
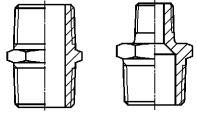
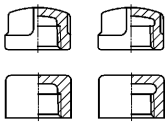
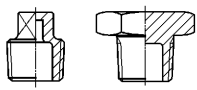
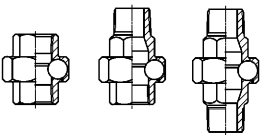
| Diagram                                                                             | Type                                      | Symbol | Dimension table     |
|-------------------------------------------------------------------------------------|-------------------------------------------|--------|---------------------|
|  | Elbows and reducing elbows                | E1, E2 | Table 5 and table 6 |
|  | 45° elbows                                | E3     | Table 7             |
|  | Male and female elbows<br>(street elbows) | E4     | Table 8             |
|  | Tees and reducing tees                    | T1, T2 | Table 5 and table 6 |
|  | Crosses                                   | X1     | Table 5             |
|  | Half sockets (parallel internal thread)   | S1     | Table 9             |
|  | Half sockets (taper internal thread)      | S2     | Table 10            |

**Table 1** (concluded)

| Diagram                                                                             | Type                                                 | Symbol                 | Dimension table       |
|-------------------------------------------------------------------------------------|------------------------------------------------------|------------------------|-----------------------|
|    | Sockets (parallel internal thread)                   | S3                     | Table 11              |
|    | Sockets (taper internal thread) and reducing sockets | S4, S5                 | Table 12 and table 13 |
|    | Bushing                                              | B1                     | Table 14              |
|    | Hexagon nipples and reducing hexagon nipples         | N1, N2                 | Table 15 and table 16 |
|    | Caps                                                 | C1                     | Table 17              |
|  | Plugs                                                | P1, P2                 | Table 18              |
|  | Unions                                               | U1, U2, U3, U4, U5, U6 | Table 19              |

## 5 Fitting size

Fitting sizes shall be designated based on the nominal designations of thread according to **JIS B 0203**. For the purposes of designations, symbols R, Rc and Rp shall be omitted.

The relation between the fitting size and the nominal size (A) or the nominal size (DN) of pipes shall be as given in table 2.

**Table 2 Relation between fitting sizes and nominal sizes**

| Fitting size    | $\frac{1}{8}$ | $\frac{1}{4}$ | $\frac{3}{8}$ | $\frac{1}{2}$ | $\frac{3}{4}$ | 1  | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2  | $2\frac{1}{2}$ | 3  | 4   |
|-----------------|---------------|---------------|---------------|---------------|---------------|----|----------------|----------------|----|----------------|----|-----|
| Nominal size A  | 6             | 8             | 10            | 15            | 20            | 25 | 32             | 40             | 50 | 65             | 80 | 100 |
| Nominal size DN | 6             | 8             | 10            | 15            | 20            | 25 | 32             | 40             | 50 | 65             | 80 | 100 |

Designations specifying the sizes of reducing fittings shall be as follows.

- a) **Case having two outlets** To be designated in numerical order, the larger diameter as ① and the smaller as ② (① × ②).

- b) **Case having three outlets** To be designated in numerical order, two same diameters on the same centreline as ① and the rest as ② (① × ②).

## 6 Performances

### 6.1 Leakage tightness

Fittings shall be free from leakage when tested according to 11.1.

### 6.2 Hydrostatic pressure resistance

Fittings shall be free from abnormalities such as leakage, deformation and breakage when tested according to 11.2.

### 6.3 Corrosion resistance

Fittings shall be free from cracking due to intergranular corrosion when tested according to 11.3.

### 6.4 Leaching

Fittings shall satisfy the criterion on leaching<sup>2)</sup> determined by the Ministerial Ordinance based on the structure and material of water supplying apparatus in Waterworks Act when tested according to 11.4. However, the test items shall be taste, odour, chromaticity, turbidity, iron and chemical compounds and hexavalent chromium compounds.

Note <sup>2)</sup> The judging criterion on leaching shall be based on the standard of leachate of water supplying equipment installed on other than the terminal of water supplying apparatus listed in the attached paper 1 of the said Ministerial Ordinance, or of the leachate of the water supply pipes.

## 7 Manufacturing method and materials

The manufacturing method and materials of fittings shall be as follows.

- a) Fittings shall be manufactured by the methods of castings, rolling, forgings, machining, etc.
- b) Material shall be austenitic stainless steel of the material specified in JIS G 5121, JIS G 3214, JIS G 4303 or JIS G 3459, or those at least equal to in quality.
- c) Fittings manufactured by casting shall be subjected to the solution treatment according to JIS G 5121.
- d) Fittings manufactured by rolling or forging shall finally be in the condition where they are subjected to the solution treatment.

## 8 Pressure-temperature ratings

The pressure-temperature ratings shall be as given in table 3.

**Table 3 Pressure-temperature ratings**

| Temperature<br>°C                                                                                                                        | Non-shock maximum allowable<br>working pressure<br>MPa |
|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| -20 to 40                                                                                                                                | 2.00                                                   |
| 100                                                                                                                                      | 1.65                                                   |
| 150                                                                                                                                      | 1.50                                                   |
| 200                                                                                                                                      | 1.40                                                   |
| 220                                                                                                                                      | 1.35                                                   |
| NOTE 1 When temperature or pressure of the fluid used is in intermediate given in this table, linear interpolation method is applicable. |                                                        |
| NOTE 2 Temperatures indicated in this table are those of internal fluid.                                                                 |                                                        |
| NOTE 3 Piping loads, stresses and moments are not taken into account.                                                                    |                                                        |

## 9 Shapes, dimensions and dimensional tolerances

### 9.1 Threads

Threads shall be as follows.

- The jointing threads of fittings shall be taper pipe threads specified in **JIS B 0203**.  
The internal thread may be either of the taper thread or the parallel thread.
- The fastening threads of union nuts shall be those specified in **JIS B 0202** or **JIS B 0205-4**.
- The useful threads of fitting shall be free from defects such as harmful thin threads, broken crests, etc.

### 9.2 Alignment of thread axis lines

The alignment of thread axis lines shall be accurate to within  $\pm 0.5^\circ$  against the axis lines of fitting shown in figure 1.

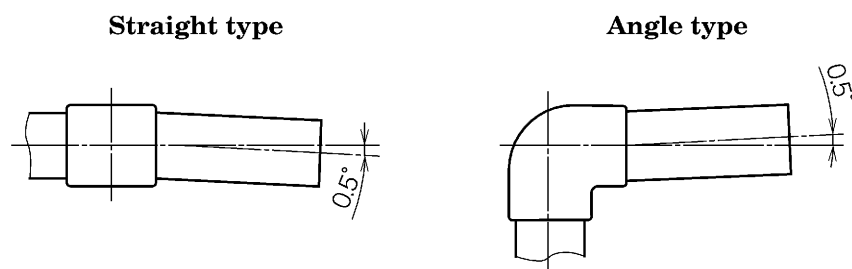


**Figure 1 Alignment of thread axis lines**

### 9.3 Chamfering

The outlets of fittings shall be chamfered.